IN THE SPECIFICATION

Page 4, lines 9 and 10 and 17

OPERATIONAL DESCRIPTION OF PREFERRED EMBODIMENT

Referring now to FIGURE 2, electrical power enters from the AC power line on lines 1 and 2 to the AC to DC converter module 3 and leaves on lines 4 and 5 plus and minus DC power. In this case the AC to DC conversion module 3 is a bridge rectifier assembly. The output of the AC to DC conversion module is supplied to Block 86 which is whatever form of public domain voltage regulator that is desired by the designer. Block 6 is the half bridge converter as shown in Figure 1. Line 17 connects between point A of Figure 1 and the control module 24. Line 18 connects point B of Figure 1 to the control module. The output of the half bridge is on line 7 and connects to inductor 8 via blocking capacitor 9. It also connects to control module 24 via line 19. DC blocking capacitor 9 is large enough that its value does not enter into the resonant calculation but acts simply to pass the AC with little or no impedance while totally blocking any DC component from flowing into the load. Inductor 8 and capacitor 10 make up a series resonant circuit that converts the square wave output of the half bridge to a sine wave. This is applied to the output load in this case a gas discharge lighting device 15 by lines 16 and 11. Transformer 12 connected between lines 16 and 11 through current sense resistor 72, across the load provides power for the lamp's heaters 91 and 92 on secondary windings 13 and 14.

Page 7 lines 10/11 and 27

Referring now to FIGURE 5 which is a depiction of the logic power module which supplies power to the control module on module output 44. When power is first applied to the ballast DC bus voltage is applied to FET 117 through resistors 115 and 116. Power to drive the FET 117 is applied through resistor 115 and is set by the zener diode 118. The voltage at the source of FET 117 and thus the anode of diode 119 is equal to the voltage of the zener diode 118 and the turn on voltage threshold of FET 117. Power thus flows from the DC supply via line 93 through resistor 115, FET 117 and diode 119 to ~~logic power supply line 44~~. regulating transistor 124. Once the ballast is operating power is supplied from winding 95 on inductor 8 via line 96. Diodes 120 and 122 and capacitor 121 make up a charge pump to supply the right amount of logic power as the voltage on winding varies over a considerable range during operation and starting of the ballast. It is also necessary that current flow both directions in all windings of inductor 8 thus a charge pump, a center tapped winding or a bridge assembly must be used. If a simple half wave rectifier were used, which would be fine with the rest of the circuit, the DC component of the current would upset for operation of the ballast.

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Once the ballast is operational the DC voltage at 126, the junction of the cathodes of diodes 119 and 120, will be higher than that at the anode of 119 and therefore FET 117 will be biased off and no further current will be drawn from the DC bus. As a result small inexpensive low power components may be used as they are operational for only a few hundred milliseconds when power is first applied to the ballast. Since the voltage varies at point 126, a regulation transistor 124 must be inserted in series with point 126 and logic power output 44. Transistor 124 is driven by the current flowing through resistor 123. The logic voltage is set by the voltage zener diode 125.

Referring ~~not~~ now to Figure 6 which is identical to Figure 2 with two exceptions. One secondary windings 95 and 97 which were on inductor 8 in Figure 2 are shown on heater transformer 12. Two, a 0-10 volt to PWM (Pulse Width Modulation) 128 converter is shown along with opto isolator 131. The o-10 volt signal enters on line 127 and is

Page 8 lines 3 and 7

converted to a digital PWM signal and applied to the opto isolator 131 on line 130. The output of the opto isolator 131 is connected to the control module 24 on line 30. Opto isolators are much more reliable and less expensive if ~~the~~ they transmit only digital signals. The opto isolator provides the voltage isolation required by UL. Since the 0-10 volt conversion is on the isolated side of the opto isolator it must be powered by the isolated power supply. Power is supplied on line 103 for positive voltage and line 104 for the isolated common. An external PWM signal is input directly to the opto isolator on line 130 to control the operation of the ballast.